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Olfactory threshold shift following controlled 7-hour exposure to toluene and/or xylene.

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The present study was undertaken to examine olfactory perception threshold (OPT) shift following exposure of healthy subjects to toluene and/or xylene in an Inhalation chamber. Five volunteers were exposed to 50 ppm toluene, 40 ppm xylene or an additive mixture of the two, for a period of 7 consecutive hr in an inhalation chamber. A Latin square design was used and subjects were exposed over 3 consecutive days/week, with an 11-day interval between each 3-day session.

Olfactory perception thresholds, measured in decibels (ds), were ascertained for both toluene and PM-carbinol, contained in 100 ml bottles with serially increasing concentrations (Olfacto-Lab Kits # 191 & 11). Test administration was based on the forced choice method. Analysis of variance of pre-exposure OPTs indicated that for both toluene and PM-carbinol, significant differences were observed between individuals (p less than 0.05), but not between days or weeks. Measurements, made immediately following exposures revealed a significant six-fold increase in OPT for toluene (median: 15 ds), while PM-carbinol OPT remained stable. Individual differences were observed, but there was no effect of type of exposure, day, week, or interactions. OPT for toluene, determined at intervals following cessation of exposure, indicated a return to pre-exposure values at a mean rate of 6.8 ds/hr. The findings of this study suggest that there is a substantial olfactory threshold shift during a 7-hr period, specific to a particular solvent or family of solvents. Receptor-specific saturation is proposed as the underlying mechanism.

Major Subject Heading(s)	Minor Subject Heading(s)	CAS Registry / EC Numbers
<ul style="list-style-type: none"> • Sensory Thresholds [drug effects] • Smell [drug effects] • Toluene [administration & dosage] • Xylenes [administration & dosage] 	<ul style="list-style-type: none"> • Administration, Inhalation • Adult • Middle Aged • Reference Values • Time Factors 	<ul style="list-style-type: none"> • 0 (Xylenes) • 108-88-3 (Toluene)

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